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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,650	12/17/2001	Gyoo-Chul Jo	053785-5043	8522

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EXAMINER

CHEN, KIN CHAN

ART UNIT	PAPER NUMBER
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1765

4f

DATE MAILED: 04/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,650

Applicant(s)

JO ET AL.

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 6, 7, 16, and 17 are objected to because of the following informalities: In claims 6, 7, 16, and 17, "selected from a group including" is unclear as to the scope of the claim. The examiner suggests replacing it with "selected from the group consisting of". Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Korenowski (US 4,140,772).

Korenowski teaches an etchant comprising hydrogen peroxide and a mixed solution including an acid such as sulfuric acid or nitric acid. The etchant may include a hydrogen peroxide stabilizer (col. 2, lines 1-3, 36-38).

It is noted that in claims 5 and 7, applicant only further limits the organic acid or neutral salt in the group which at least one is included in a mixed solution. However, it is

not required that the organic acid or neutral salt be chosen from the group. Therefore, claims 5 and 7 are rejected for the same reasons as claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenowski (US 4,140,772).

Korenowski teaches an etchant comprising hydrogen peroxide and a mixed solution including an acid such as sulfuric acid or nitric acid. The etchant may include a hydrogen peroxide stabilizer (col. 2, lines 1-3, 36-38).

Korenowski teaches that the above etchant may be used to etch metals such as copper, alloy of copper, molybdenum and the like. Therefore, it would have been obvious to one with ordinary skill in the art to etch copper, alloy of copper, molybdenum or the combination thereof (so-called double-layered metal layer in the instant claims).

6. Claims 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenowski (US 4,140,772) in view of admitted prior art.

Art Unit: 1765

Korenowski teaches an etchant comprising hydrogen peroxide and a mixed solution including an acid such as sulfuric acid or nitric acid. The etchant may include a hydrogen peroxide stabilizer (col. 2, lines 1-3, 36-38).

Korenowski teaches that the above etchant may be used to etch metals such as copper, alloy of copper, molybdenum and the like. Therefore, it would have been obvious to one with ordinary skill in the art to etch copper, alloy of copper, molybdenum or the combination thereof (so-called double-layered metal layer in the instant claims).

Korenowski does not particular about the structure that being subjected to etching in its process. The claimed invention differs from Korenowski by specifying the conventional method of forming an array substrate for use in a TFT-LCD device. The admitted prior art is relied on to show said conventional method. The admitted prior art teaches forming a gate line and gate electrode; forming an active layer and an ohmic contact layer thereon; forming a double-layered data line, a double-layered source electrode line, a double-layered drain electrode line using an etchant and forming a pixel electrode contacting the double-layer drain electrode. The double layer may be copper or alloy of copper with molybdenum (see pages 4-6 of the specification; Fig. 1 and 2). Because it is a conventional method and it is disclosed in the admitted prior art, hence, it would have been obvious to one with ordinary skill in the art to use the etchant of Korenowski in the method of forming an array substrate for use in a TFT-LCD device in order to provide their art recognized advantages and produce an expected result.

It is noted that in claims 15 and 17, applicant only further limits the organic acid or neutral salt in the group which at least one is included in a mixed solution. However,

Art Unit: 1765

it is not required that the organic acid or neutral salt be chosen from the group.

Therefore, claims 15 and 17 are rejected for the same reasons as claim 8.

7. Claims 8, 10, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenowski (US 4,140,772) in view of Hong et al. (US 6,130,443; hereinafter "Hong").

Korenowski teaches an etchant comprising hydrogen peroxide and a mixed solution including an acid such as sulfuric acid or nitric acid. The etchant may include a hydrogen peroxide stabilizer (col. 2, lines 1-3, 36-38).

Korenowski teaches that the above etchant may be used to etch metals such as copper, alloy of copper, molybdenum and the like. Therefore, it would have been obvious to one with ordinary skill in the art to etch copper, alloy of copper, molybdenum or the combination thereof (so-called double-layered metal layer in the instant claims).

Korenowski does not particular about the structure that being subjected to etching in its process. The claimed invention differs from Korenowski by specifying the conventional method of forming an array substrate for use in a TFT-LCD device. Hong is relied on to show said conventional method. Hong teaches forming a gate line and gate electrode; forming an active layer and an ohmic contact layer thereon; forming a triple-layered data line, a triple-layered source electrode line, a triple-layered drain electrode line using an etchant and forming a pixel electrode contacting the drain electrode (see Figs 4 and 5; col. 4). Because it is a conventional method and it is disclosed by Hong, hence, it would have been obvious to one with ordinary skill in the

Art Unit: 1765

art to use the etchant of Korenowski in the method of forming an array substrate for use in a TFT-LCD device in order to provide their art recognized advantages and produce an expected result.

It is noted that in claims 15 and 17, applicant only further limits the organic acid or neutral salt in the group which at least one is included in a mixed solution. However, it is not required that the organic acid or neutral salt be chosen from the group.

Therefore, claims 15 and 17 are rejected for the same reasons as claim 8.

8. Claims 9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korenowski and Hong as applied to claim 8 above, and further in view of Chae et al. (US 6,515,726 ; hereinafter "Chae").

The discussion of modified Korenowski and Hong from above is repeated here.

Hong does not disclose that the metal lines may be copper or copper alloy with molybdenum. In a method of forming LCD, Chae teaches that metal lines for data , drain electrode or source electrode may use copper or copper alloy with molybdenum so as to form a low resistance interconnection with high chemical resistance (see abstract). Hence, it would have been obvious to one with ordinary skill in the art to use copper or copper alloy with molybdenum as metal lines for data, drain electrode or source electrode because Chae teaches that to do so forming a low resistance interconnection with high chemical resistance.

Art Unit: 1765

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

K-C C
April 10, 2003


Patent Examiner
Group Art Unit 1765